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10/667,522	09/23/2003	David A. Jackson	66396-057	2568

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EXAMINER	
COHEN, AMY R	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,522	JACKSON ET AL.	
	Examiner	Art Unit	
	Amy R. Cohen	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12,13 and 15-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12,13 and 15-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/25/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 3 objected to because of the following informalities:

Claim 3 claim language refers to "the visible indicator" which has been deleted in the current amendment from claim 1. It appears that the subject matter of claim 3 is similar to the subject matter of claims 29 and 30. Therefore, the rejection for claim 3 will be found in the rejection for claims 29 and 30.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 4-9, 12, 13, 15-18, 20-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (U. S. Patent No. 5,724,743) in view of Hendrix (U. S. Patent No. 6,115,927).

Regarding claims 1, 2, 4-9, 12: Jackson discloses a three-dimensional camera based position determination system (Fig. 2 and 110), comprising: an optically scannable target (126) device fixedly attached to a target object (112-115); at least one camera and light subsystem (122), each subsystem having: an image sensing device configured to view the optically scannable target device and to generate image information indicative of geometric characteristics of the target device (148); and at least one light emitting diode (142) operatively coupled to a

strobe circuit (Col 7, lines 45-50), the at least one diode and circuit being configured to emit strobed light thereby illuminating the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); and a data processing device (32, 34, 36, Fig. 2) operatively coupled to the image sensing device, the data processing device being configured to determine the orientation of the target object based on the generated target image.

Jackson discloses the position determining system wherein the at least one light emitting diode is an array of light emitting diodes (Col 21, lines 1-15); wherein the number of light emitting diodes in the array is sixty-four (Col 21, lines 1-15);

Jackson discloses the position determination system wherein the target object is a vehicle wheel (112-115), and the data processing device is further configured to determine proper wheel alignment based on orientation of the vehicle wheel (Abstract);

Jackson discloses the position determination system wherein the image sensing device includes an electronic shutter that is synchronized with the at least one strobed light emitting diode such that an image is captured only when a target is illuminated (Col 7, lines 15-50).

Jackson discloses the position determination system wherein the image sensing device is a charge-coupled device video camera (Col 6, lines 62-66, Col 21, lines 16-30).

Jackson does not disclose the position determination system wherein the at least one light emitting diode comprises at least one invisible light emitting diode; wherein the invisible light is infrared light; a current source configured to supply a current to the at least one invisible light emitting diode.

Hendrix discloses a three-dimensional camera based position determining system, comprising: at least one camera and light subsystem (16, 12), each subsystem having: an image

sensing device (16) configured to generate image information (Col 4, lines 46-54, Col 7, lines 12-28); and at least one invisible light emitting diode (14) operative coupled to a strobe circuit, the at least one diode and circuit being configured to emit strobed invisible light that is directed to the image sensing device and the image sensing device detects and forms an image (Col 5, lines 1-13); a data processing device (20) operative coupled to the image sensing device, the data processing device being configured to determine the orientation of an object based on the generated image (Col 10, lines 6-65); and a visible indicator (22) that indicates whether the at least one invisible diode is operative (Col 10, lines 6-65).

Hendrix discloses the position determination system wherein the invisible light is infrared light (Col 4, lines 46-54, Col 5, lines 32-44); wherein the at least one invisible light emitting diode is an array of light emitting diodes (Col 4, lines 46-54, Col 5, lines 32-44); wherein the image sensing device is a charge-coupled device video camera (Col 7, lines 12-28).

Hendrix discloses the position determination system comprising a current source configured to supply a current to the at least one invisible light emitting diode (Col 4, line 46-Col 5, line 13).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the light emitting diodes of Jackson include at least one invisible light emitting diode, as taught by Hendrix, since Hendrix discloses that invisible and visible light are alternative and functionally equivalent in the use of the device (Hendrix, Col 5, lines 5-12), and so that the work area where the device is being used is not as visibly optically cluttered to the user, as it would be with the visible light being emitted.

Regarding the number of invisible light emitting diodes in the array being eighty (claim 6): Jackson and Hendrix disclose a position determining system where the number of invisible light emitting diodes in the array is sixty-four. However, to choose a value for the number of

diodes in the array to be eighty, absent any criticality, is only considered to be the "optimum" value of the number of diodes in the array, as stated above, that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the desired accuracy and since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See ***In re Boesch***, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the number of invisible light emitting diodes in the array of Jackson and Hendrix to have eighty invisible light emitting diodes in order to have more diodes in the array, increasing the accuracy of the array and hence, the accuracy of the position determining system.

Regarding claims 13, 15, 16: Jackson discloses a three-dimensional camera based position determination system, comprising: an optically scannable target device (126) fixedly attached to a target object (Figs. 2, 4, 9); at least one camera and light subsystem (122), each subsystem having: an image sensing device (148) configured to view the optically scannable target device and to generate image information indicative of geometric characteristics of the target device (Col 21, lines 1-16); and at least one light emitting diode (140, 142) operatively coupled to a strobe circuit, the at least one diode and circuit being configured to emit strobed light thereby illuminating the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 45-50, Col 20, line 55-Col 21, line 30); a data processing device operatively coupled to the image sensing device, the data processing device being configured to determine the orientation of the target object based on the generated target image (Col 8, lines 46-64, Col 9, lines 40-65); and a target image indicator, disposed on the camera and light subsystem (since the camera and light subsystem is not described in "closed" claim language, the target image

indicator is considered to be on the camera and light subsystem), configured to display the status of target acquisition by the data processing device, wherein the status of the target acquisition indicated whether an obtained image of the scannable target is acceptable (Col 12, line 65-Col 13, line 19).

Jackson discloses the position determination system wherein the target object is a vehicle (Figs. 2, 4, 9).

Jackson does not disclose the position determination system wherein the emitted light is invisible light; comprising a directional indicator for indicating a manner by which the target object should be manipulated; wherein the directional indicator indicates whether the vehicle should be moved forward or backward, or whether a wheel of the vehicle should be steered right or left.

Hendrix discloses a three-dimensional position determination system wherein the image sensing device is a camera (16); wherein the at least one diode (14) is operatively coupled to a strobe circuit (Col 5, lines 5-13); wherein the target object indicator is configured to display the status of target acquisition by the data processing device, wherein the status of target acquisition indicates whether an obtained image of the scannable target is acceptable (Col 9, line 60-Col 10, line 18); comprising a directional indicator for indicating a manner by which the target object should be manipulated (Col 10, lines 6-65); wherein the directional indicator indicates whether the vehicle should be moved forward or backward, or whether a wheel of the vehicle should be steered right or left (Col 10, lines 6-65).

Hendrix discloses the position determination system comprising a directional indicator for indicating a manner by which the target object should be manipulated (Col 11, lines 51-67); wherein the directional indicator indicates whether the vehicle should be moved forward or backward, or whether a wheel of the vehicle should be steered right or left (Col 11, lines 51-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the light emitting diodes of Jackson include at least one invisible light emitting diode, as taught by Hendrix, since Hendrix discloses that invisible and visible light are alternative and functionally equivalent in the use of the device (Hendrix, Col 5, lines 5-12), and so that the work area where the device is being used is not as visibly optically cluttered to the user, as it would be with the visible light being emitted; and to include a visual indicator for indicating a manner by which the object should be manipulated to the position determination system of Jackson, as taught by Hendrix, so that a user could more accurately manipulate the object in order to get the most accurate results (Hendrix, Col 11, lines 51-67).

Regarding claims 17, 18, 20-25: Jackson discloses a three-dimensional camera based position determination system (Fig. 2 and 110), comprising: sensing means for sensing an image of a target device, and generating information indicative of geometric characteristics of the target device (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); and emission means for emitting strobed light that illuminates the optically scannable target such that the light is retro-reflected to the image sensing device (Col 7, lines 45-50, Col 21, lines 1-20) and the image sensing device detects and forms and image of the target (Col 10, lines 37-48, Col 20, lines 25-36); and data processing means for determining the orientation of the object based on the generated target image (Col 8, line 45-Col 9, line 23, Col 10, lines 37-48).

Jackson discloses the position determination system wherein the target object is a vehicle wheel, and the data processing means is configured to determine proper wheel alignment of the vehicle wheel (Figs. 2, 4, 9, Col 1, lines 5-18).

Jackson discloses the position determination system wherein the image sensing means includes an electronic shutter that is synchronized with the emission means such that an image is captured only when a target is illuminated (Col 7, lines 45-50).

Jackson discloses the position determination system comprising attachment means for fixedly attaching an optically scannable target device to a target object (Fig. 9, Col 20, lines 55-67).

Jackson discloses the position determination system comprising target object indicator means for indicating that the sensing means is sensing the target object (Col 9, lines 8-23, Col 12, line 65-Co 13, line 44, specifically Col 13, lines 36-44, the pattern recognition will indicate that the sensing means is sensing the target object).

Jackson discloses the position determination system comprising target object indicator means for indicating the state of target acquisition by the data processing device (Col 8, lines 46-64, Col 12, line 65-Col 13, line 19).

Jackson does not disclose the position determination system wherein the emitted light is invisible light; wherein the invisible light is infrared light; comprising directional means for indicating the direction in which a target object should be repositioned, and for indicating that a target object has been properly positioned.

Hendrix discloses a three-dimensional camera based position determining system, comprising: sensing means for sensing an image of a target device, and generating image information indicative of the geometric characteristics of the target object (Col 4, lines 46-54, Col 7, lines 12-28); and emission means for emitting strobed invisible light that illuminates the optically scannable target (Col 5, lines 1-13); and a data processing means for determining the orientation of the target object based on the generated target image (Col 10, lines 6-65).

Hendrix discloses the position determination system wherein the invisible light is infrared light (Col 4, lines 46-54, Col 5, lines 32-44); comprising directional means for indicating the direction in which a target object should be repositioned, and for indicating that a target object has been properly positioned (Col 11, lines 51-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the light emitting diodes of Jackson include at least one invisible light emitting diode, as taught by Hendrix, since Hendrix discloses that invisible and visible light are alternative and functionally equivalent in the use of the device (Hendrix, Col 5, lines 5-12), and so that the work area where the device is being used is not as visibly optically cluttered to the user, as it would be with the visible light being emitted.

Regarding claims 26 and 27 (wherein claim 27 claim language is directed to the "means" for each positively claimed component of claim 26): Jackson discloses an image-based position determination system (Fig. 2 and 110) for optically scanning a target device related to an object, the system comprising: at least one camera and light subsystem (122), each subsystem having: an image sensing device configured to view the target device and to generate image information indicative of geometric characteristics of the target device (148); and at least one light emitting diode (142) operatively coupled to a strobe circuit (Col 7, lines 45-50), the at least one diode and circuit being configured to emit strobed light thereby illuminating the target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); and a data processing device (32, 34, 36, Fig. 2) configured to couple to the image sensing device to determine the orientation of the object based on the generated target image (Col 8, line 45-Col 9, line 23, Col 10, lines 37-48).

Jackson does not disclose the position determination device comprising a visual indicator for indicating a manner by which the object should be manipulated such that the image sensing device obtains an image of the target device in a different position, the data processing device configured to couple to the visual indicator and the image sensing device.

Hendrix discloses a position determination device comprising a visual indicator for indicating a manner by which the object should be manipulated such that the image sensing device obtains an image of the target device in a different position, the data processing device configured to couple to the visual indicator and the image sensing device (Col 10, lines 6-18, Col 11, lines 51-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a visual indicator for indicating a manner by which the object should be manipulated to the position determination system of Jackson, as taught by Hendrix, so that a user could more accurately manipulate the object in order to get the most accurate results (Hendrix, Col 11, lines 51-67).

Regarding claim 28: Jackson discloses a three-dimensional camera based position determination system, comprising: an optically scannable target device (126) fixedly attached to a target object (Figs. 2, 4, 9); at least one camera and light subsystem (122), each subsystem having: an image sensing device (148) configured to view the optically scannable target device and to generate image information indicative of geometric characteristics of the target device (Col 21, lines 1-16); and at least one light emitting diode (140, 142) operatively coupled to a strobe circuit, the at least one diode and circuit being configured to emit strobed light thereby illuminating the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 45-50, Col 20, line 55-Col 21, line 30); a data processing device operatively coupled to the image sensing device, the data processing device being configured to determine the orientation of the target object based on the generated target image (Col 8, lines 46-64, Col 9, lines 40-65); and a target image indicator that displays the status of target acquisition by the data processing

device, wherein the status of the target acquisition indicated whether an obtained image of the scannable target is acceptable (Col 12, line 65-Col 13, line 19).

Jackson does not disclose the position determination device comprising directional means for indicating the direction in which the target object should be repositioned, and for indicating whether the target object has been properly positioned.

Hendrix discloses a position determination device comprising directional means for indicating the direction in which the target object should be repositioned, and for indicating whether the target object has been properly positioned (Col 10, lines 6-18, Col 11, lines 51-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include directional means for indicating the direction in which the target object should be repositioned to the position determination system of Jackson, as taught by Hendrix, so that a user could more accurately manipulate the object in order to get the most accurate results (Hendrix, Col 11, lines 51-67).

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson and Hendrix as applied to claims 1, 2, 4-9, 12, 13, 15-18, 20-28 above, and further in view of Stam et al. (U. S. Patent No. 5,923,027).

Jackson and Hendrix disclose the position determining system as described above in paragraph 3.

Jackson and Hendrix do not disclose a position determining system wherein the image sensing device is a complimentary metal oxide semiconductor camera.

Stam et al. discloses an image sensing device, which is a complimentary metal oxide semiconductor camera (Col 5, lines 45-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensing device of Jackson and Hendrix to be a complimentary

metal oxide semiconductor camera, as taught by Stam et al., since the complimentary metal oxide semiconductor camera is both economical and highly sensitive and therefore, more cost effective and accurate (Stam et al., Col 5, lines 45-58).

5. Claims 3, 19, 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson and Hendrix as applied to claim 1, 2, 4-9, 12, 13, 15-18, 20-28 above, and further in view of Liss et al. (U. S. Patent No. 4,614,866).

Jackson and Hendrix disclose the position determination system as described above in paragraph 3.

Jackson and Hendrix do not disclose the position determination system including a visible indicator that conclusively indicates whether the at least one invisible light emitting diode is operative, wherein the visible indicator is disposed in the camera and light subsystem.

Liss et al. discloses a system comprising a visible indicator that conclusively indicates whether at least one invisible light emitting diode is operative (Col 1, line 59-Col 2, line 6, Col 2, lines 50-60, Col 4, lines 12-35); wherein the visible indicator emits light within the visible spectrum (68), and thereby indicates that the at least one invisible light emitting diode is operative (Col 1, line 59-Col 2, line 6, Col 2, lines 50-60, Col 4, lines 12-35); wherein the visible indicator is disposed in the camera and light subsystem (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a conclusive indicator indicating whether the at least one invisible light emitting diode is operative to the device of Jackson and Hendrix, as taught by Liss et al., in order for the operator to conclusively and immediately determine that the device is operative, increasing the usefulness of the device for operators of varying levels of proficiency in the use of the device (Liss et al., Col 1, line 59-Col 2, line 25).

Response to Arguments

6. Applicant's arguments with respect to claims 1-10, 12, 13, 15-131 have been considered but are moot in view of the new ground(s) of rejection.

7. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to include an invisible light emitting diode in the device of Jackson is taught by Hendrix, in that Hendrix discloses that invisible and visible light are alternative and functionally equivalent in the use of the device (Hendrix, Col 5, lines 5-12), further motivation is so that the work area where the device is being used is not as visibly optically cluttered to the user, as it would be with the visible light being emitted and that there is an expectation of success in using invisible light as opposed to visible light since the properties of light, i.e. retro-reflection, hold for both visible and invisible light.

8. Regarding Applicant's arguments that the indicators of claims 13, 26-28 are "part of a camera/light subsystem", Applicant is reminded that the claim language of the camera and light subsystem is not described in "closed" claim language, the target image indicator is considered to be on the camera and light subsystem, since it is part of the overall system. Moreover, there is no structural relationship given to the camera/light subsystem, therefore, the claim language of "disposed on the camera and light subsystem" is interpreted in the broadest sense, in that the indicator is part of the camera and light subsystem, which is part of the overall system.

9. Regarding Applicant's arguments that Hendrix does not teach an indicator to indicate a direction by which an object under test should be moved relative to the cameras, Applicant is directed to Hendrix, Col 11, lines 51-67, wherein this specific feature is discussed.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy R. Cohen whose telephone number is (571) 272-2238. The examiner can normally be reached on 8 am - 5 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ARC
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